ICT&S Center

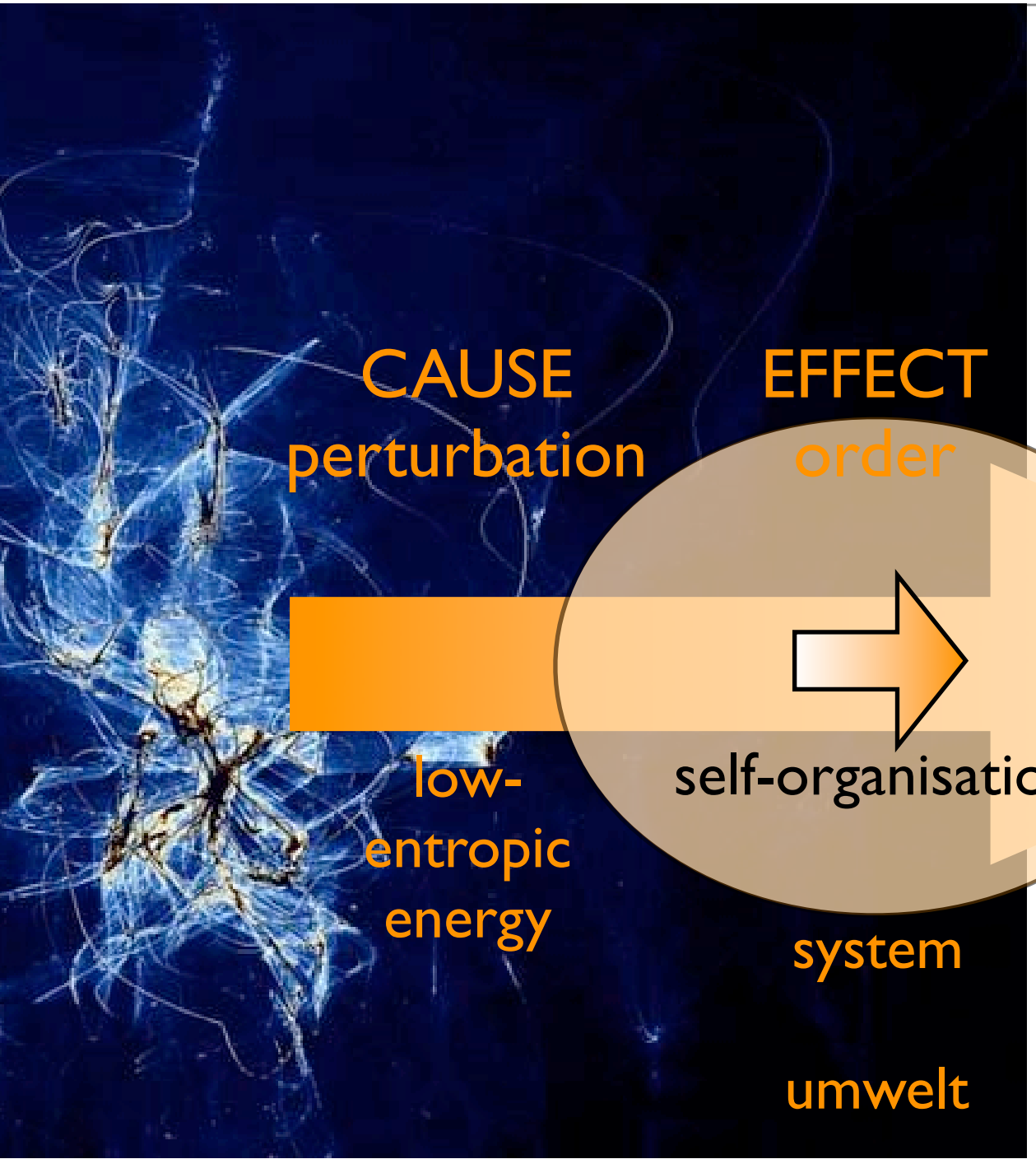
UNIVERSITÄT SALZBURG

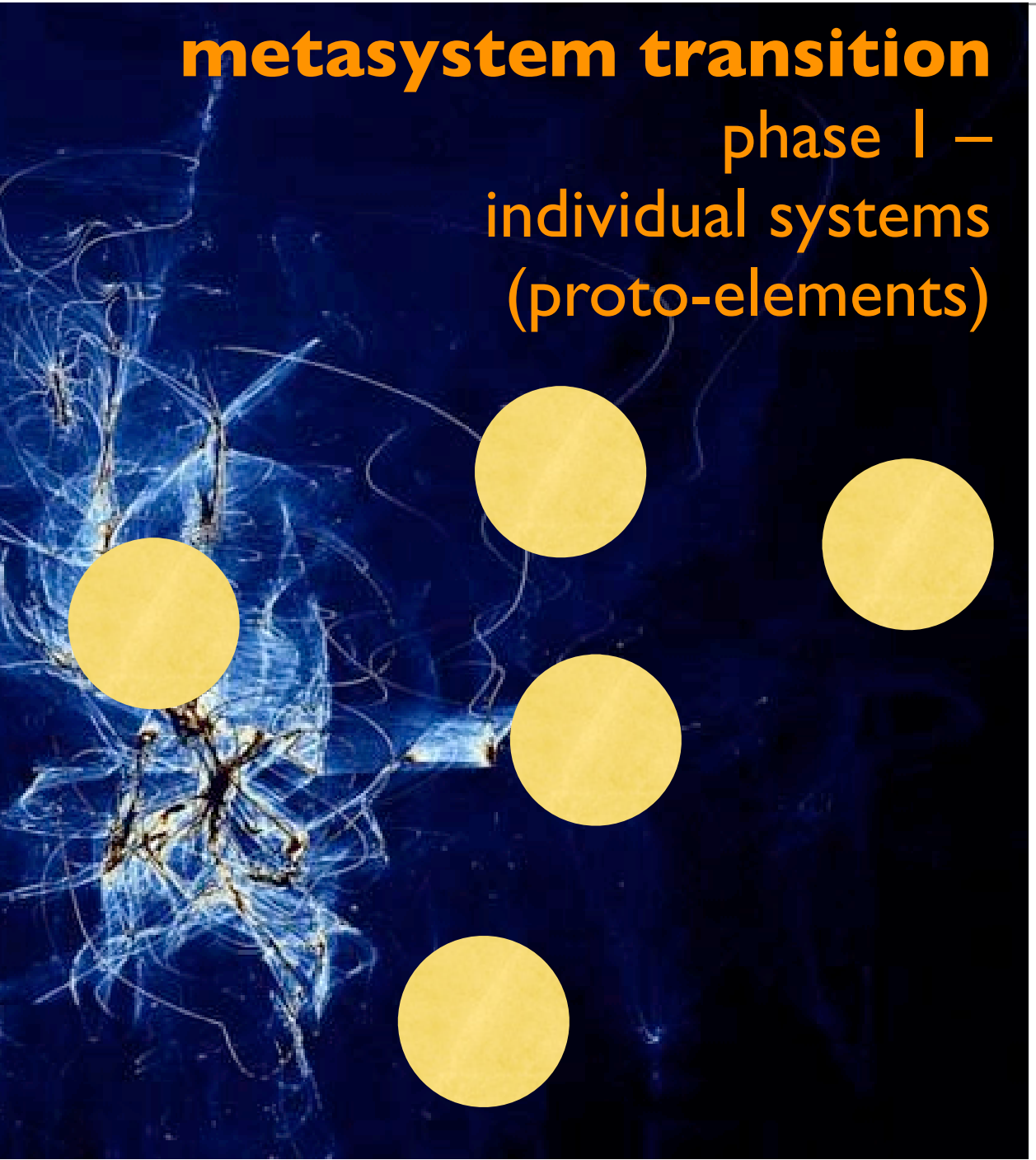
Self-organisation, less-than-strict-determinism and the four Aristotelian causes

Wolfgang Hofkirchner

Bolzano, April 2006

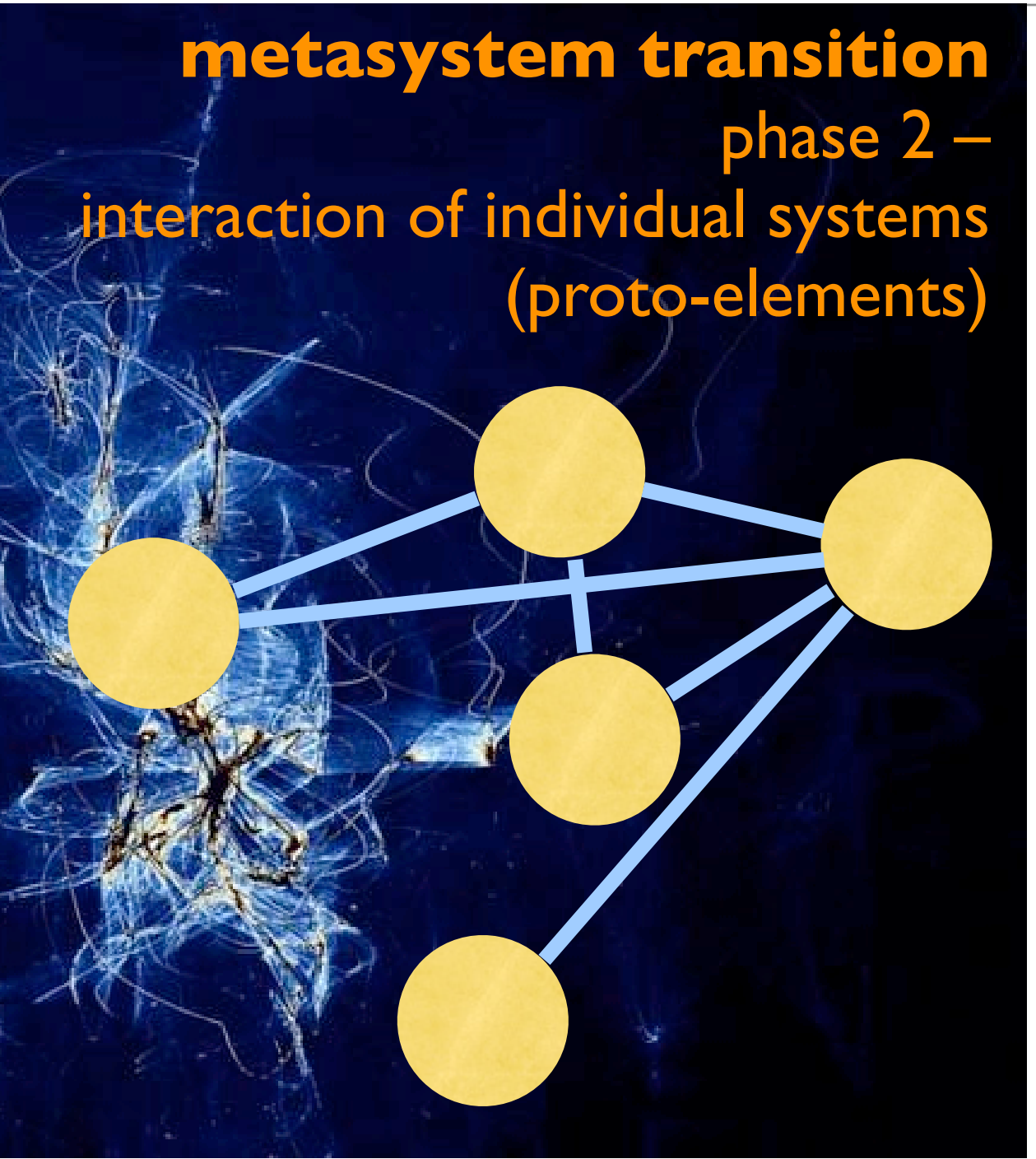
self-organisation





self-organisation

emergence

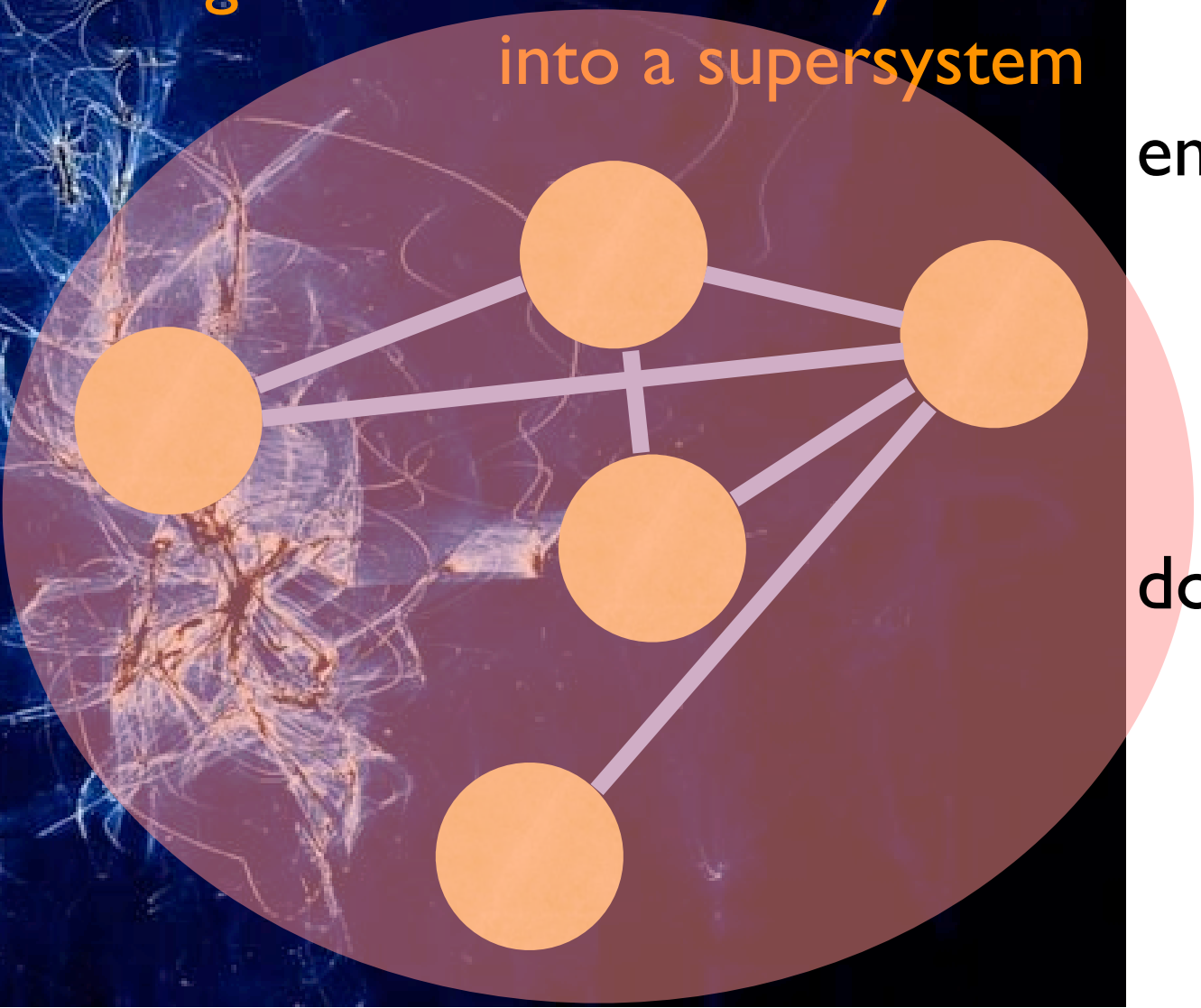


self-organisation

emergence

metasystem transition

phase 3 –
integration of individual systems
into a supersystem



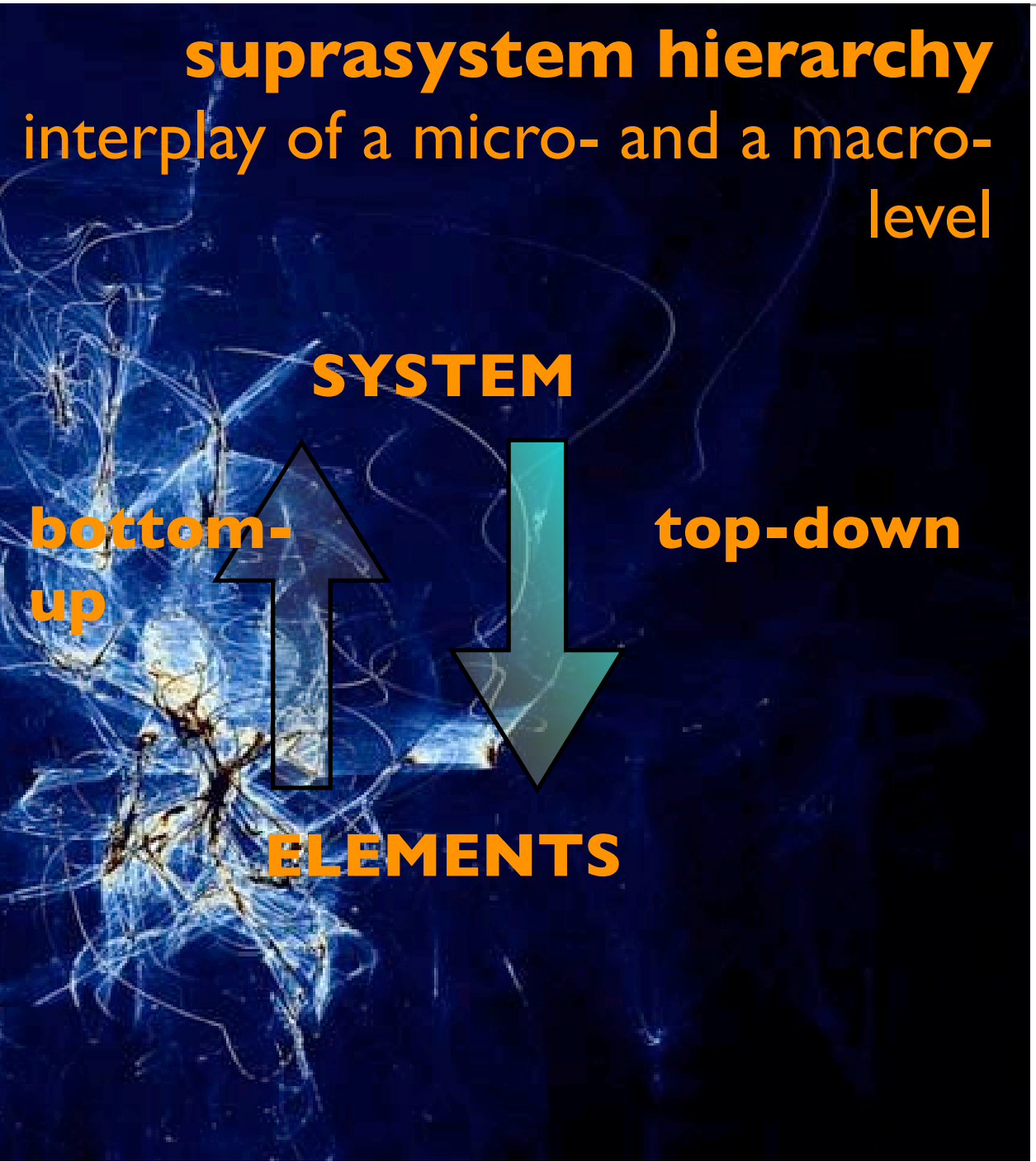
self-organisation

emergence

dominance

suprasystem hierarchy

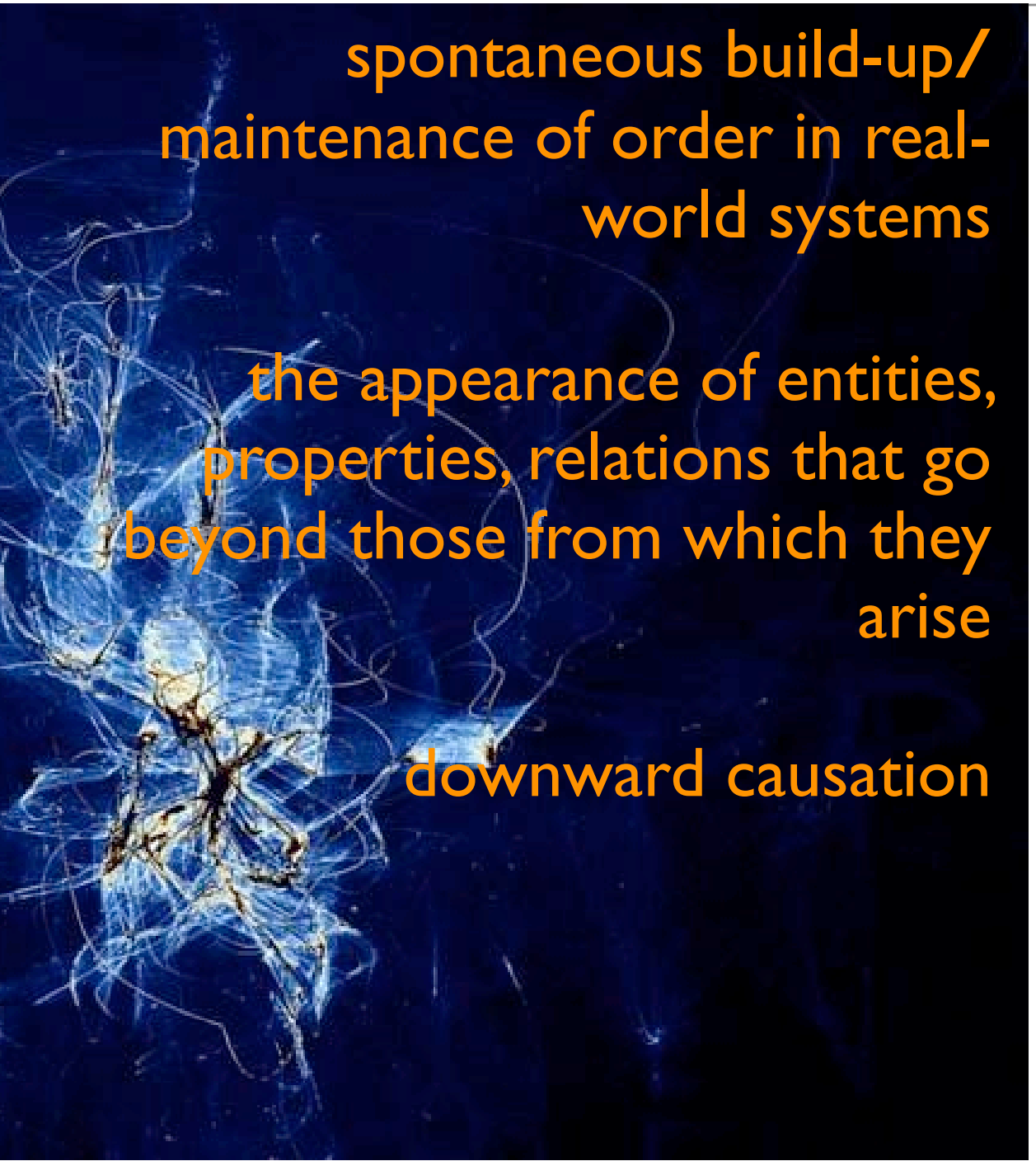
interplay of a micro- and a macro-level



self-organisation

emergence

dominance



spontaneous build-up/ maintenance of order in real-world systems

self-organisation

the appearance of entities, properties, relations that go beyond those from which they arise

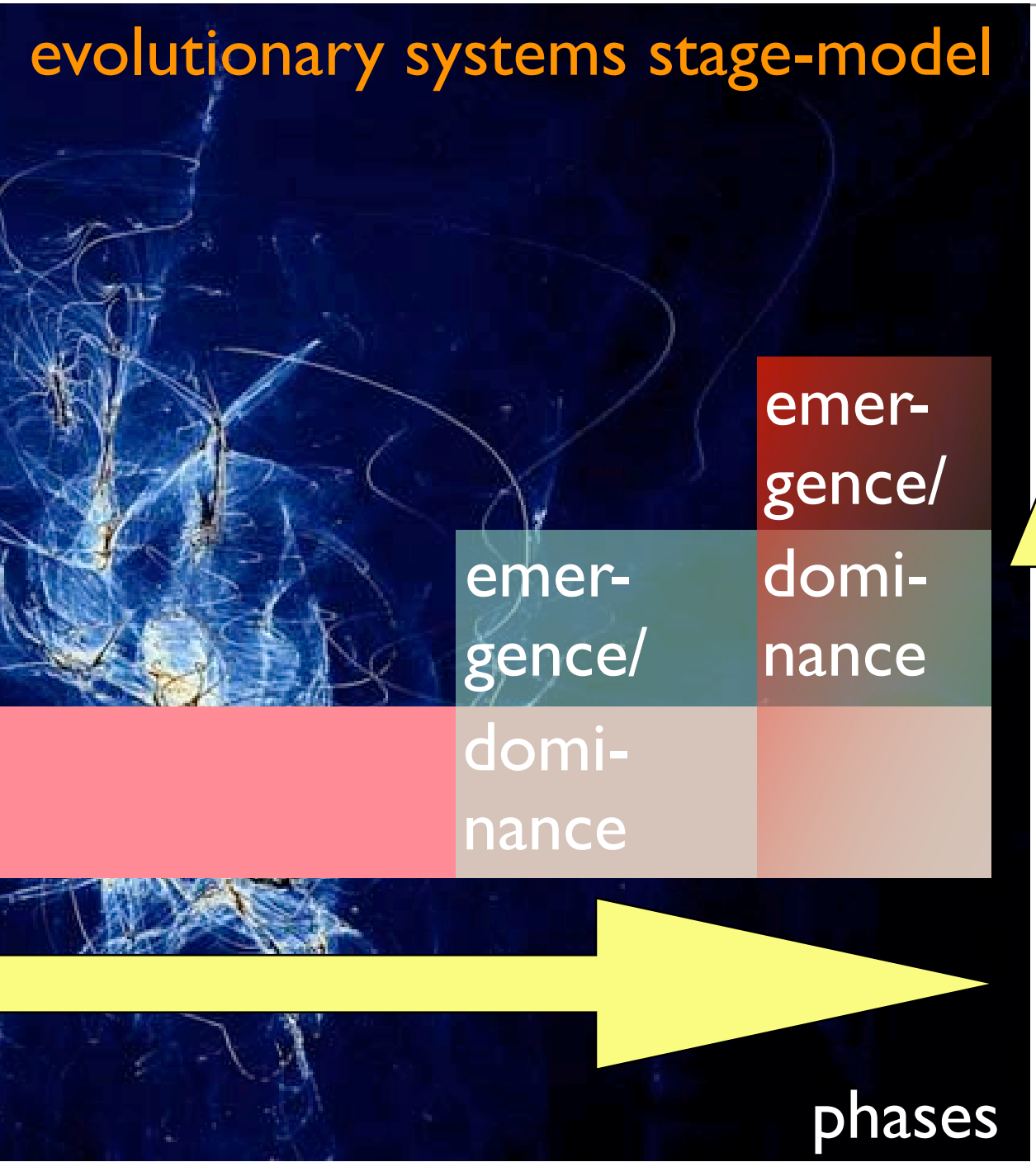
emergence

downward causation

dominance

evolutionary systems stage-model

self-organisation



preformationism:
the new is nothing new at all

teleologism:
the old is pulled by the new

atomism:
the whole is the sum of its parts

holism:
the whole is independent of its parts

less-than-strict-determinism:

I determinism

cosmos,
clockwork,
necessary causation

everything may happen

less-than-strict-determinism:
2 indeterminism

chaos,
clouds,
no causation at all

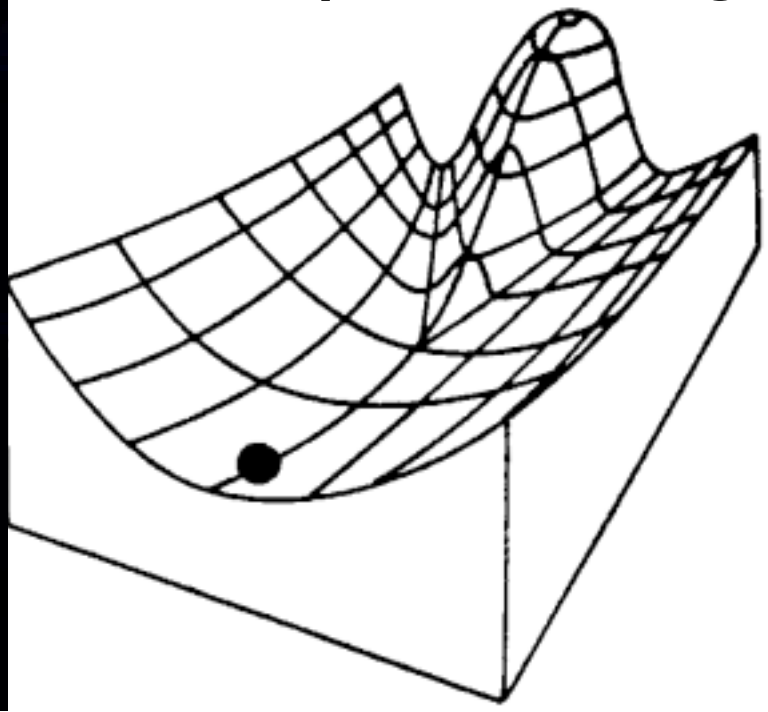
beyond determinism and indeterminism

propensities (Popper),
habits (Peirce)

there is a unity of the one and the many

less-than-strict-determinism

chaosmos,
great oaks from little acorns,
causation may be necessary or contingent



"The old universe was a perfectly regulated watch. The new universe is an uncertain cloud.
… uncertainty which is inevitably ours, who are peripheral observers, limited in our senses, deformed in our intellect, ignorant of most what goes on in space and of all that will unfold in time, may also be, to boot, the uncertainty of the universe itself, which does not yet know what is going to happen to it…"

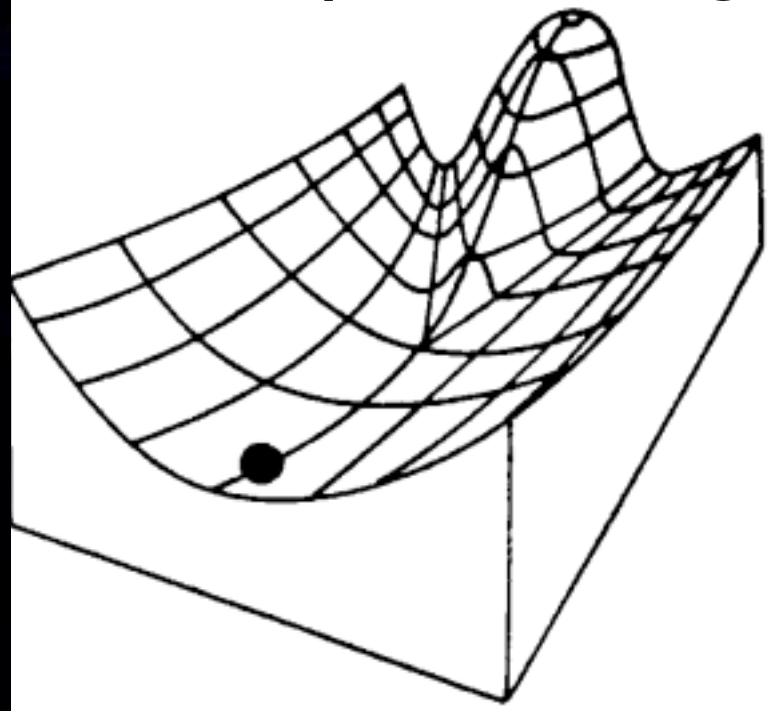
– Edgar Morin, Nature de la nature, 1977 (Method I, 1992) –

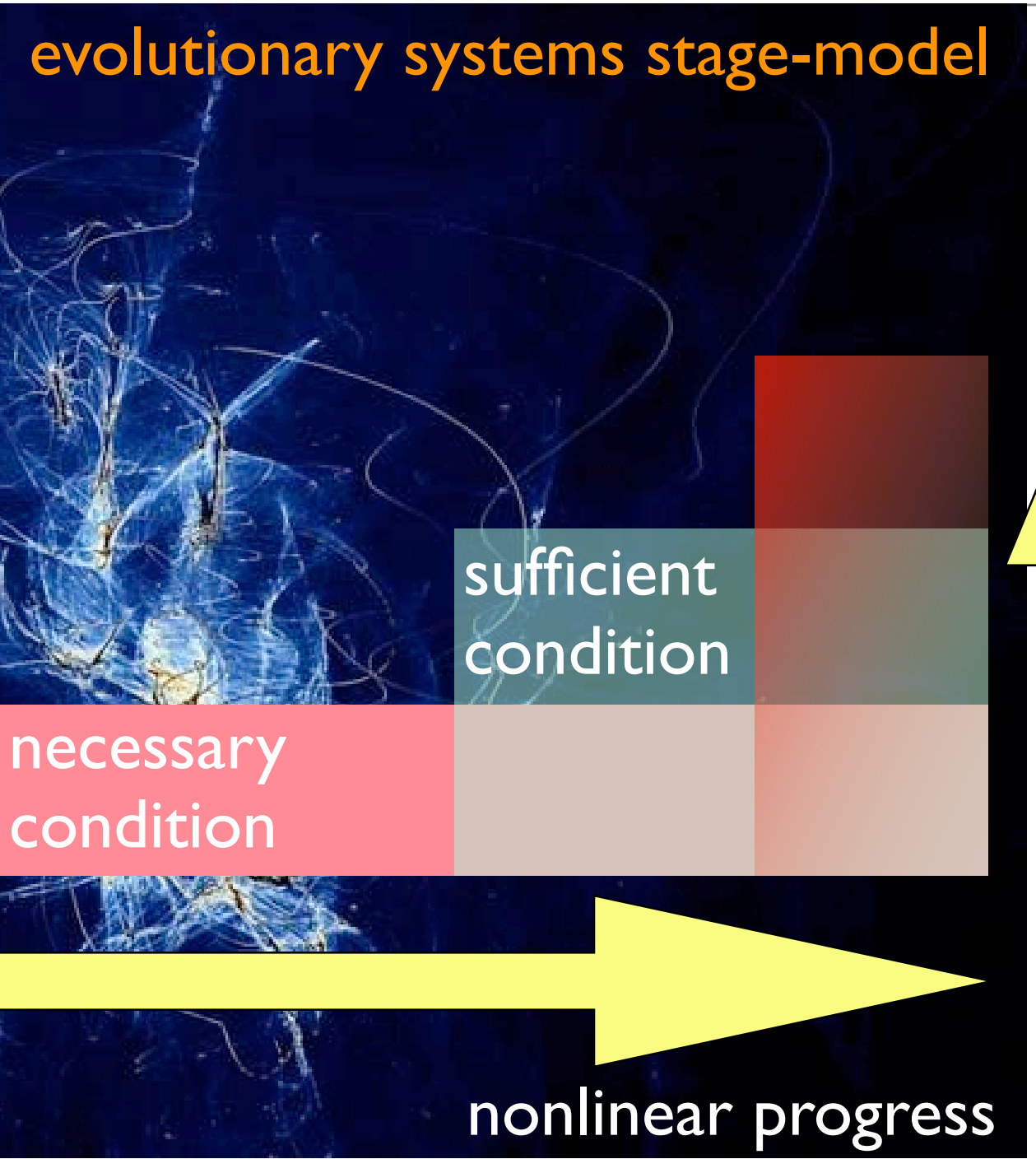
less-than-strict-determinism

chaosmos

great oaks from little acorns

causation may be necessary or contingent

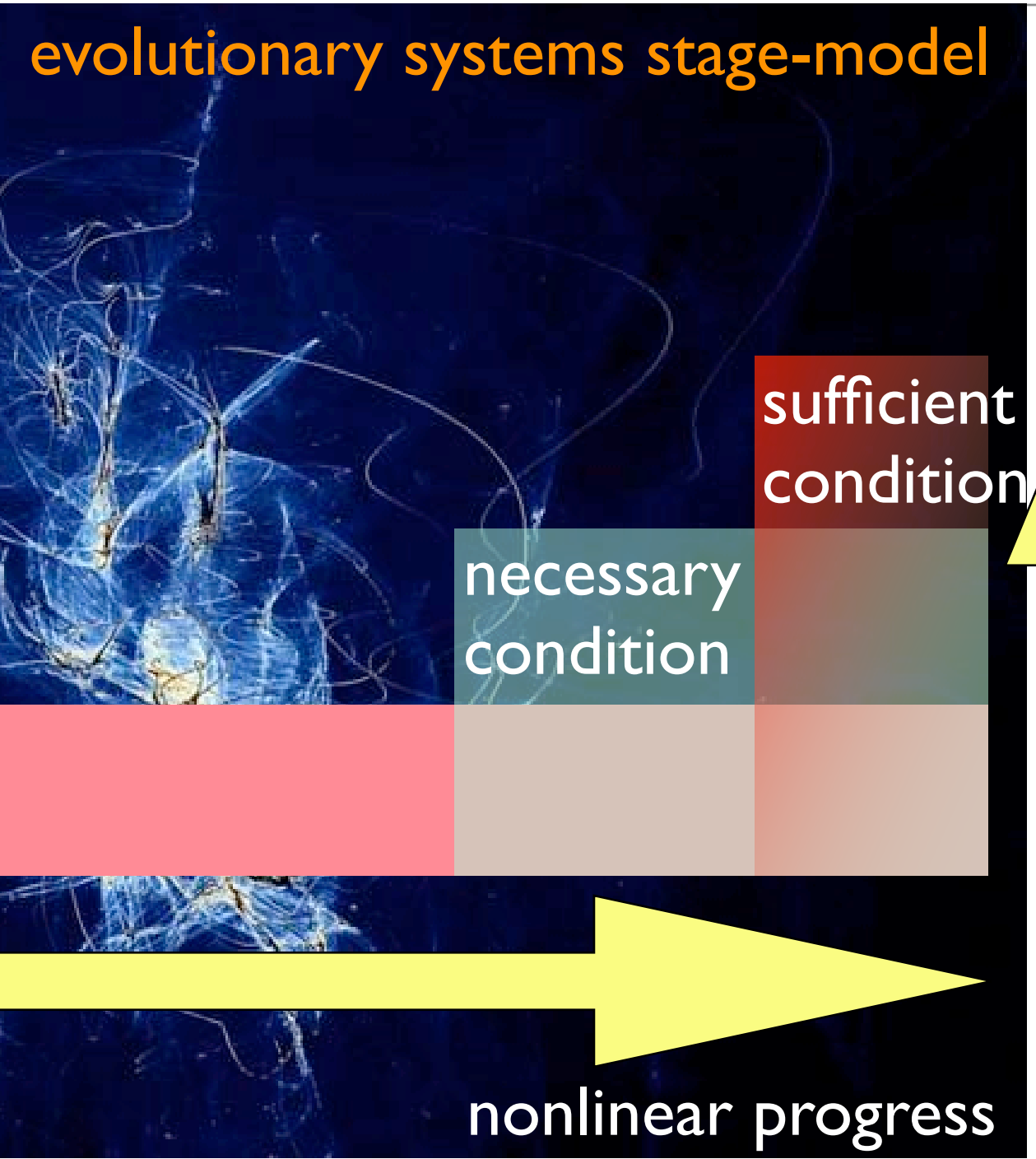




less-than-strict-determinism

dialectical spiraling-up

evolutionary systems stage-model



less-than-strict-determinism

dialectical spiraling-up

one-sided determinations

preformationism:
the new is nothing new at all

teleologism:
the old is pulled by the new

atomism:
the whole is the sum of its parts

holism:
the whole is independent of its parts

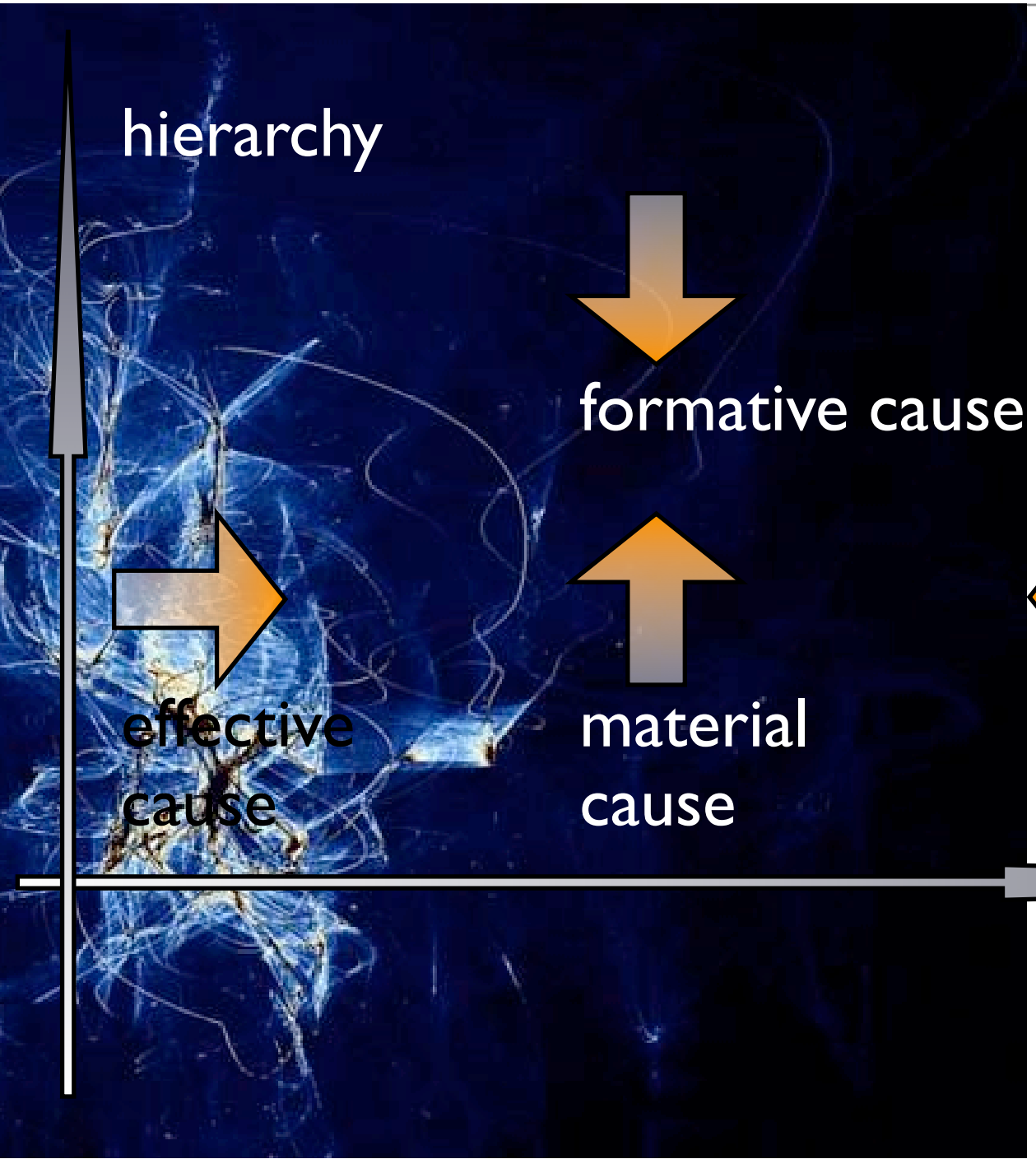
the four Aristotelian causes

effective cause

final cause

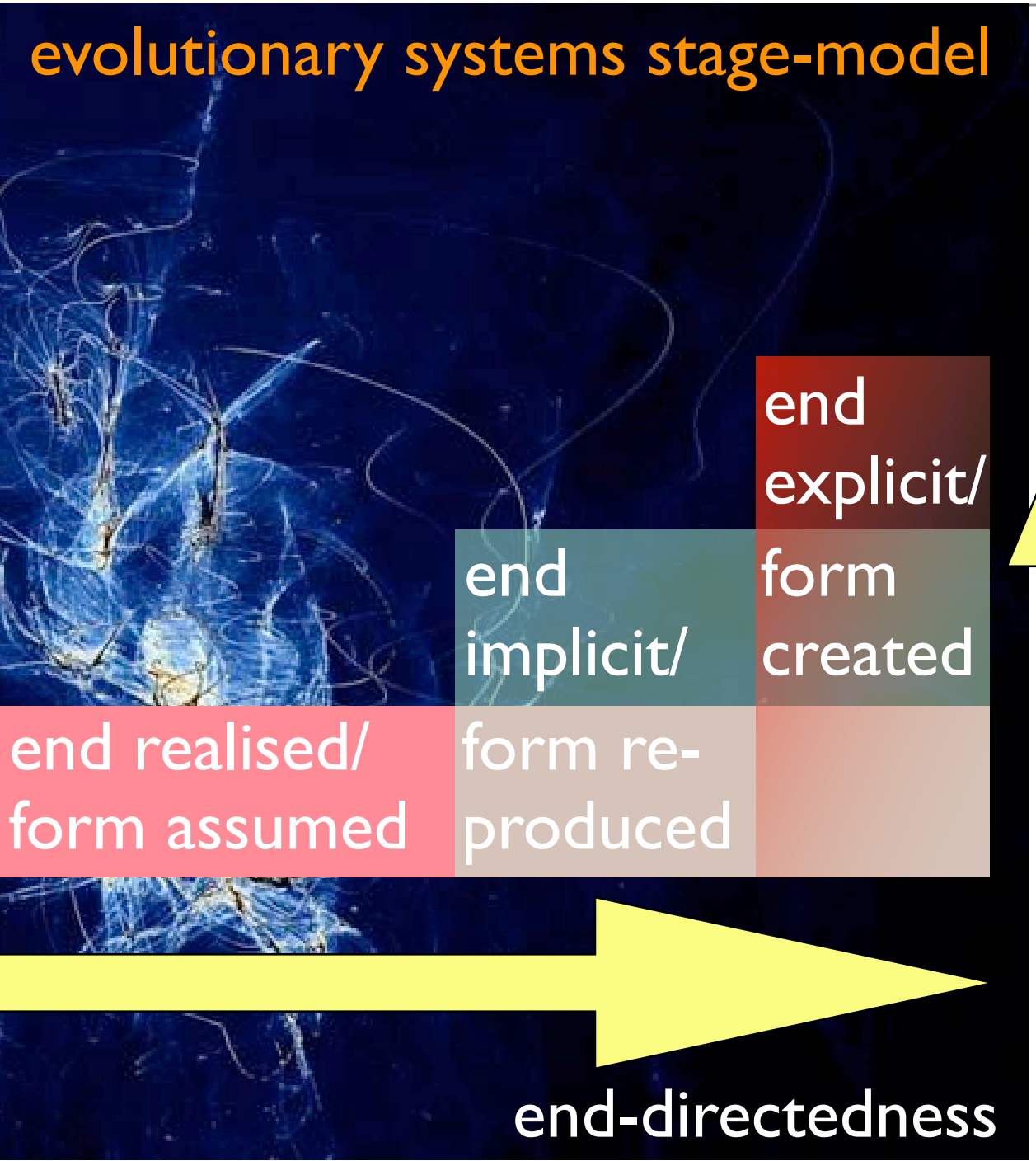
material cause

formative cause



the four Aristotelian causes

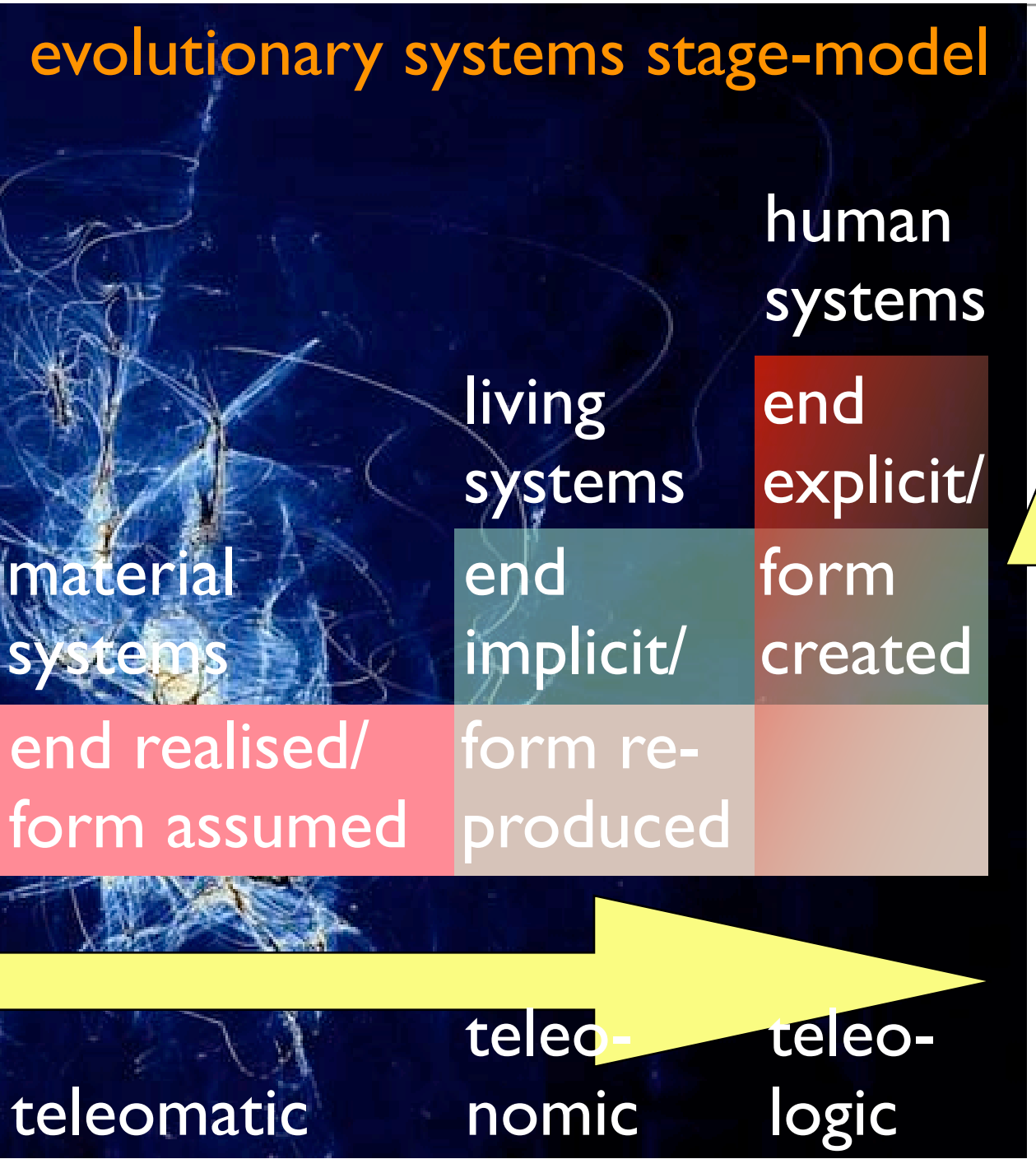
dialectical account of causation



the four Aristotelian causes

the rise of subjectivity

formative power



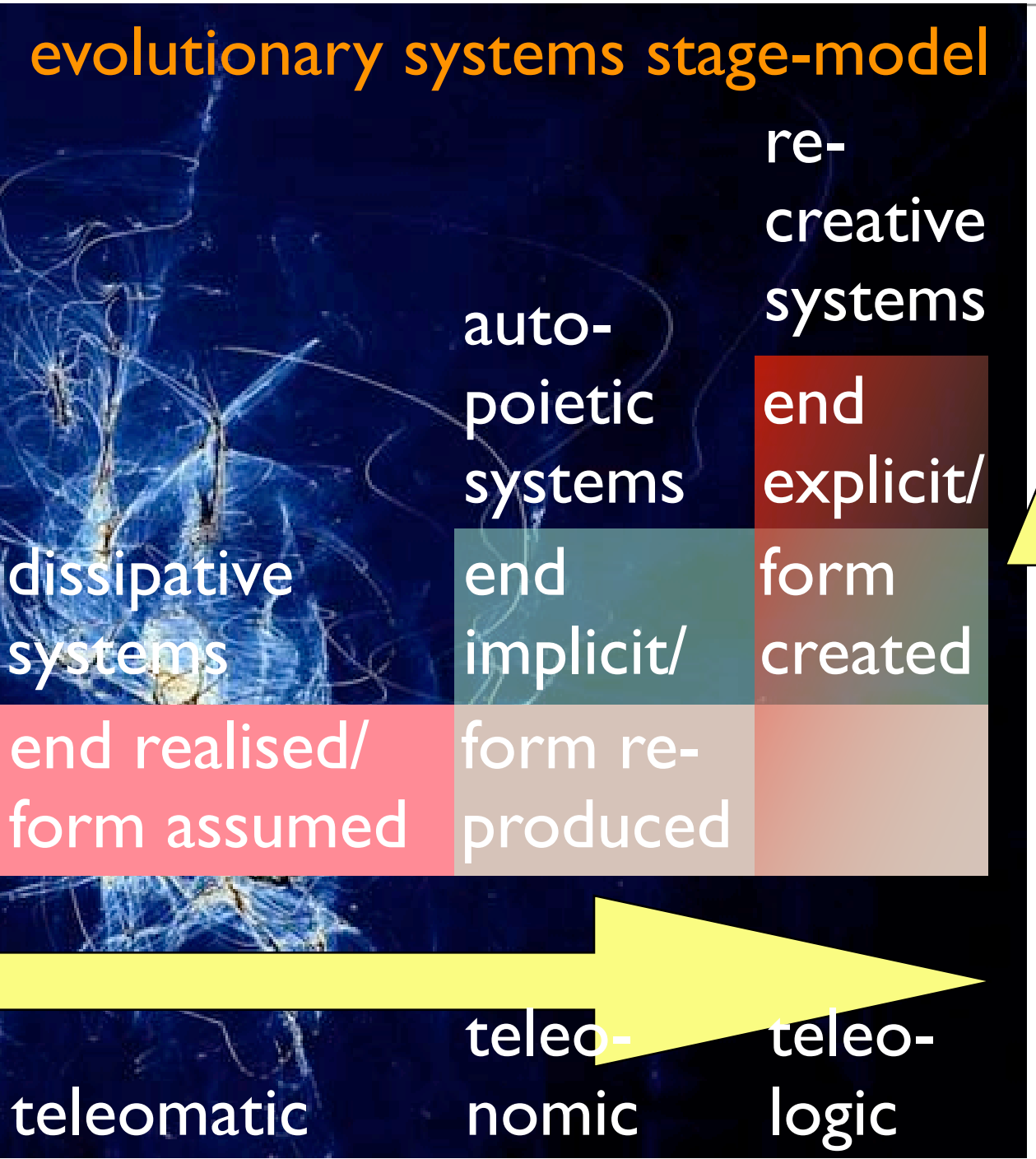
the four Aristotelian causes

the rise of subjectivity

self-inventive

self-maintaining

self-referential



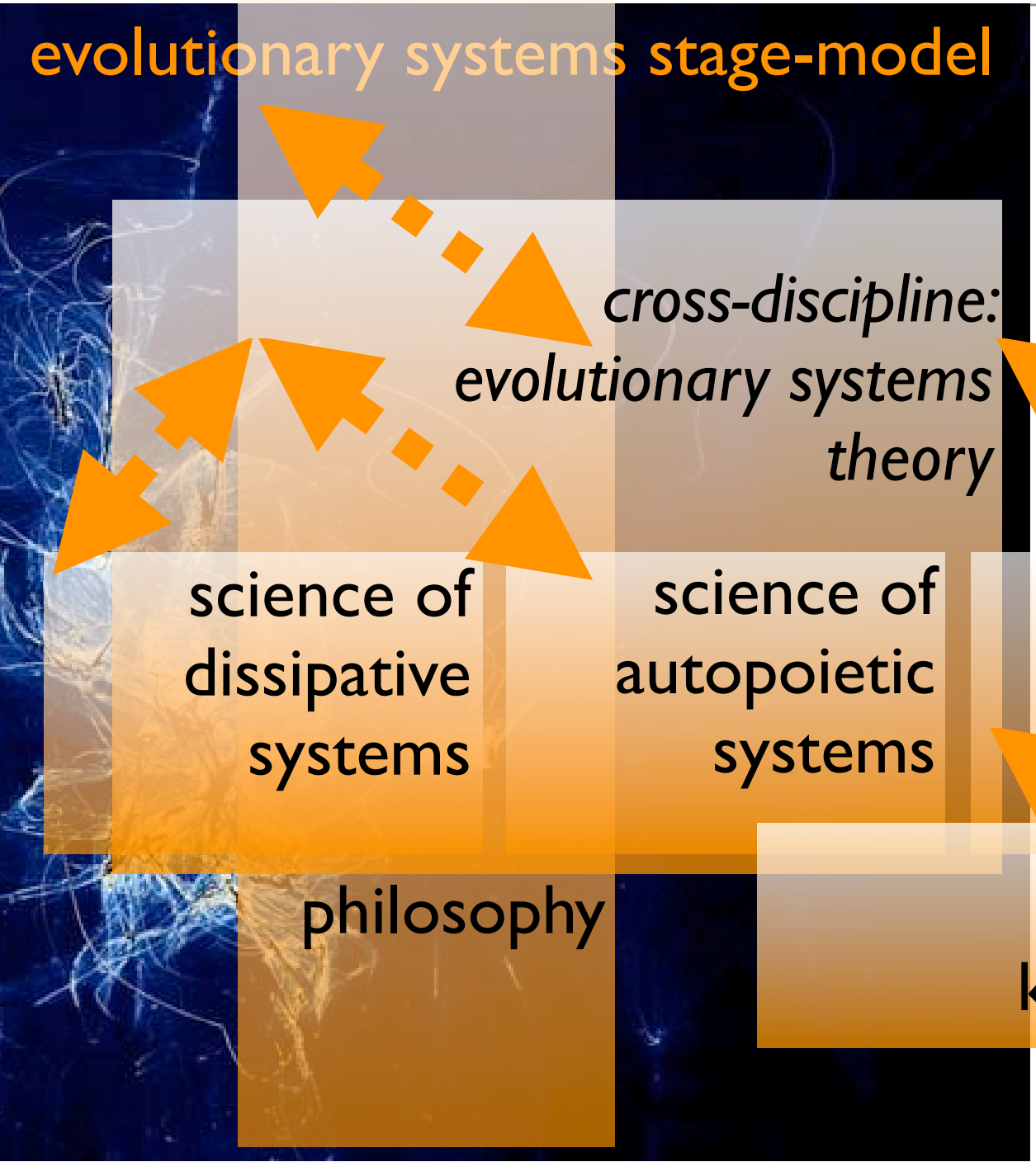
the four Aristotelian causes

the rise of subjectivity

self-inventive

self-maintaining

self-referential



evolutionary systems stage-model

the four Aristotelian causes

self-organisation unfolded

cross-discipline: evolutionary systems theory

science of dissipative systems

science of autopoietic systems

science of re-creative systems

philosophy

science of the knowledge-based society